Metropolitan District Commission - Division of Watershed Management

# Silviculture Fact Sheet

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## 1. Description of Watershed Activity

Silviculture is the deliberate management of trees and other resources to create forest conditions that meet landowner objectives. Like agriculture, silviculture involves active tending to accelerate production of the desired commodities, and various harvesting methods to extract crops (timber and cordwood). Silviculture in Massachusetts seldom involves cutting more frequently than once every 15-20 years in any given stand of trees, and the full cycle for a tree crop is often 80-100 years. While timber harvesting enables landowners to realize the economic benefits of tending the forest, it can also bring about desired silvicultural changes such as forest regeneration or a shift in species composition.

Landowner objectives dictate the types of silviculture that take place on MDC watersheds. On MDC's own properties, the primary objective is the maintenance of a forest cover that is diverse enough to resist and recover from natural disturbances, thus providing long-term protection of the water supply. On private forestlands throughout the watersheds, forest management objectives range from carefully planned silviculture to simple liquidation of timber resources. Logging to clear land for development precludes silviculture, and is more a change in land use than a planned forest management activity.

There are approximately 200,000 acres of forest across the MDC watersheds, split almost equally between MDC and private or other state agency ownership. Within this overall forest, silvicultural cuttings occur on 1-2% of the land each year. A typical timber harvesting lot on these watersheds might contain 50,000 to 150,000 board feet (a board foot is a piece of wood 12 inches square and one inch thick, and is the common measurement standard in American forestry) across an area of 25-75 acres, and would be completed in 3-6 weeks. The

**The principal goal of the MDC's Division of Watershed Management is to ensure the production and protection of the best possible drinking water from its watersheds. The maintenance of a vigorous forest cover is of critical importance in meeting this goal. For this reason, MDC has been actively involved in silviculture for many decades. As shown in the above photographs, the forest is a growing and ever-changing place. Through disturbances and the successional process, seedlings established in the understory eventually develop into mature forest cover. The most resilient cover consists of a wide variety of ages and species. A range of silvicultural techniques ensure optimal forest development for all phases of growth.**

largest operations on the watersheds might contain 500,000 to 1,000,000 board feet across 100-300 acres, and require as much as 6 months to complete. Clearcutting is much less common than partial cutting, and is generally limited to a maximum of 10 acres by the Massachusetts Forest Cutting Practices Act (MGL Ch.132).

## 2. Threat or Pollutants of Concern

The act of cutting a tree does not pose a threat to water quality. Nearly all pollution threats associated with silviculture are related to the processing and transport of timber and other forest products. Chief among these is the erosion of sediments from improperly constructed or inadequately maintained access roads, skid trails, and stream crossings. Much less common are losses of nutrients such as nitrogen or phosphorus from harvested forest areas. Active fertilization of forest soils is extremely uncommon in Massachusetts, with the very limited exception of small quantities applied to skid trails and landings to speed revegetation of bare soils. There are unquantified threats related to spills of petroleum products, ranging from minor spills of chainsaw gas and oil to the leakage of hydraulic fluid from timber harvesting equipment. Sanitation issues with forest workers pose the threat of increased pathogen concentrations on the watersheds. All potential sources of pollutants pose their greatest water quality threat when they occur in close proximity to reservoirs or tributaries.

There may be differences between the threats from silviculture operations on MDC lands versus those on private lands. All MDC operations are closely supervised by professional watershed management foresters, and subject to water quality protection measures above and beyond those required by state law. Private operations may also be under the supervision of consulting foresters, but many private operations are based on simple agreements between landowners and timber harvesters. The quality of unsupervised timber harvesting varies. Operations that exceed 25,000 board feet or involve wetland resource areas are subject to Chapter 132, and therefore require the oversight of Department of Environmental Management (DEM) foresters.

## 3. Control Strategy

During 35 years of active silviculture on MDC watershed lands, no water quality degradation has been associated with these practices. Potential water quality threats associated with silviculture on the MDC watersheds are primarily controlled through the implementation of Best Management Practices (BMPs) specified by Chapter 132 and by additional MDC-DWM water quality specifications in timber harvesting permits. Applied carefully, BMPs eliminate water quality threats associated with silviculture. These BMPs include, for example: specifications for erosion control in road and stream crossing designs; the maintenance of filter strips along

**Most forestry operations conducted on MDC lands are performed by private contractors who are held to a high standard of environmental sensitivity. All contractor activities are carefully monitored by Division forestry staff.**

water courses; limitations on equipment size and type; requirements for petroleum-absorbing pads to contain spills; and restrictions on logging when ground conditions will not support equipment.

## MDC Forest Management Activities;

| Activity/Watershed | Quabbin Reservoir | Ware River | Wachusett Resrevoir | Sudbury Reservoir | Combined Total |
|---|---|---|---|---|---|
| Acres treated 1987 – 1998 | 6,209 | 2,769 | 799 | 104 | 9,881 |
| Average annual acres treated | 564 | 251 | 72 | 9 | 896 |
| Annual percentage of managed holdings | 1.25% | 1.23% | 0.6% | 0.4% | 1.12% |
| Board feet, total | 23,288,879 | 5,827,208 | 1,408,762 | 383,665 | 30,908,514 |
| Average annual board feet | 2,117,170 | 529,746 | 128,069 | 34,879 | 2,809,864 |
| Cords, total | 16,705 | 8,888 | 3,222 | 854 | 29,669 |
| Average Annual cords | 1,519 | 808 | 293 | 78 | 2,698 |
| Tons of pulp, total | 27,930 | 17,731 | 1,588 | 0 | 47,249 |
| Average annual tons of pulp | 2,539 | 1,612 | 144 | 0 | 4,295 |

## 4. BMPs and Water Quality Protection

A primary responsibility of DWM staff foresters is to monitor the implementation of BMPs on MDC lands in order to prevent the erosion of sediments or nutrients to watercourses. During active timber harvesting operations, DWM foresters may visit operations as often as once a day, and both reserve and exercise the right to shut down operations either for non-compliance or due to extremes in weather that increase the potential for problems (primarily wet periods). DEM service foresters monitor silviculture on private lands, so long as the operation is required to file a Chapter 132 cutting plan. Most operations that involve wetlands will file a cutting plan rather than submitting to the more cumbersome wetlands protection procedures under the Wetlands Protection Act (MGL Ch. 131). Operations that are below the 25,000 board foot threshold, and do not involve wetlands, may take place without forester supervision, but cover small areas, are short in duration, and generally do not pose threats to water quality.

## 5. Current Status/Future Trend of Program Results

Silviculture has not represented a significant threat to water quality on MDC watersheds. Forestry BMP's have been required for many years in Massachusetts and were revised and updated by DEM in 1996, with input from MDC staff. Research has shown the effectiveness of BMP's in eliminating water quality threats from silviculture, and the implementation of enhanced BMP's further lessens the likelihood of future problems.

Silviculture on MDC properties has always been under close supervision of MDC forestry staff, and the completion of the 1995-2005 Quabbin Land Management Plan has strengthened the water quality objectives of MDC silviculture. On the other hand, private forestlands on the watersheds are

under pressure to liquidate timber resources in order to meet rising tax burdens. MDC has made significant progress in assisting private landowners to write long-term forest management plans that qualify them for large reductions in property taxes, hopefully reducing development pressure in the process. These plans also provide MDC some assurance that silviculture conducted on these private lands will be supervised by a professional forester for compliance with the most current BMP's.

## What is Green Certification?

The concept of "green" certification began as a way to improve harvesting practices in the tropics, but it has expanded to provide independent assessment of forestry practices throughout the world. Like the "organic" label for food, the "green" label on forest products assures consumers that sustainable practices brought the product to market, rather than shortsighted exploitation. MDC pursued green certification for Quabbin because the agency felt that independent review of the sustainability of its forest practices would provide important assurances to an increasingly concerned public. While proud of the logging standards on Quabbin properties, MDC staff felt that a certification review could suggest further improvement of those standards.

The Smart Wood program, a non-profit affiliate of the Rainforest Alliance and the National Wildlife Federation, was selected to perform the Green Certification assessment. A field assessment team carefully scrutinized thirty-five years of management plans, forest inventory data, and timber harvesting records. Timber harvesting lots were inspected for impacts on residual resources, the productivity of the operation, and the achievement of desired silvicultural effects. Field assessment considered overall threats to forest security and health, long-term sustainability of the management approach, technical quality of forest harvesting, landscape level impacts, optimization of forest potential, effects on local communities, and economic viability of the forest operations. Equipment restriction, stream bridging, oil spill protection, and attention to rare and endangered species are among the MDC practices that contribute to "sustainability".

In July of 1996, Quabbin Reservoir Watershed became the first public land in North America to be "green" certified. For certain practices, there are conditions attached that must be met within a short time in order to maintain certification. For example, future harvests at Quabbin must leave behind sufficient coarse woody debris to meet ecological requirements. Another condition requires that MDC identify and protect unusual areas, for example, scattered small stands of extremely old Tupelo trees (Black Gum) at Quabbin, or the several hundred vernal pools on the watershed. MDC anticipates being able to meet all conditions and plans to work to retain its "green" certification indefinitely.

To learn more about Green Certification, write to Stacy Brown, Regional Coordinator - Smart Wood Program, NWF Northeast Natural Resource Center, 58 State Street, Montpelier VT. 05602.

*For More information on this Fact Sheet (Reference Number FS00.05) Contact:* *(Last Revised: Aug. 2000)*

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